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RESEARCH ARTICLE

ULTRASONOGRAPHY AS A DIAGNOSTIC AID FOR DETERMINING ETIOLOGY OF ASCITES

***Asif Muzaffer Reshi**

ASCOMS, India

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****Corresponding Author:***
Asif Muzaffer Reshi

ABSTRACT

Aim: This study will be done to evaluate and determine the cause of ascites using USG meanwhile using laboratory paracentesis as a reference. **Materials and methods:** The study will be conducted in the department of Radio-Diagnosis and Imaging in co-ordination with the department of Medicine and department of Pathology at Acharya Shri Chander College of Medical Sciences and Hospital, Sidhra, Jammu. A total of 50 patients will be included in this study irrespective of the gender. Scanning technique of abdominal and pelvic ultrasound: All the US examinations will be performed using LOGIC C5 PREMIUM following a fasting period of atleast 4 hours. The results of the evaluation will be recorded on standardized proforma. Existence of septa-debris, accompanying organ pathology, omental involvement, intestinal wall thickening, peritoneal implants, lymph node, diameter of portal vein, thickening of gall bladder wall, pleural effusion, collateral vascular structure and cavernous transformation will be investigated on USG. Result of biopsy or surgical intervention will be regarded as the gold standard for the pathological diagnosis in all cases. Informed consent will be obtained from each patient. Immediately after the ultrasound examination within an average of 14 minutes interval), US guided paracentesis will be done under sterile conditions. Blood sample will also be drawn immediately after the paracentesis. The ascitic fluid and blood samples will be sent to the laboratory to determine ascitic albumin, cell count and differential as well as serum albumin and total protein. A portion of ascitic fluid sample will also be sent to the pathology unit for cytology. The serum and ascitic albumin values will be used to determine the serum ascites albumin gradient (SAAG). **Results:** In this study, a total of 50 patients with ascites will be included. In the present study, the age of the patients ranged from 05 years to 67 years. The mean age will be 48 years. The maximum number of patients 37 (74%) will be in the age group of 31-60 years. Out of 50 cases 39 (78%) will be supposedly having benign ascites and 11 (22%) malignant ascites.

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INTRODUCTION

Fluid present in the peritoneal cavity normally is around 50 ml, ascites is evident clinically when the volume of fluid is around 1500ml (Runyon, 1989). Free fluid as little as 10 ml can be detected (Forsby, 1984). Liver cirrhosis, portal hypertension, pericarditis, cancers, tuberculosis, pancreatitis and certain other different causes can result in ascites (Warrell, 2003). Among developed and developing countries Cirrhosis is the most common cause of ascites (Gupta, 1995). Blood,chyle,urine, bile or pancreatic secretions causing ascites is very unsual (Hanbidge, 2003). Physical maneuvers for diagnosis of ascites has an overall accuracy of 58% as showed by Cattau *et al*. (1982) The sensitivity of Ultrasound in detection of fluid is proven to be as little as 100 ml in cadavers and 300 ml in vivo [7] Volume estimation in ascites is important to monitor the disease progress and also to select the appropriate method of treatment (Szkodziak, 2010). Recently Ultrasound has seen increased use in evaluation of ascites, (Edell, 1979) and determination of its location.8-10 Paracentesis is important to ascertain the cause of ascites (Runyon, 2009).

This study was done to evaluate and determine the cause of ascites using USG meanwhile using laboratory paracentesis as a reference.

MATERIALS AND METHODS

The study was conducted in the department of Radio-Diagnosis and Imaging in co-ordination with the department of Medicine and department of Pathology at Acharya Shri Chander College of Medical Sciences and Hospital, Sidhra, Jammu. A total of 50 patients were included in this study irrespective of the gender.

Scanning technique of abdominal and pelvic ultrasound: All the US examinations were performed using LOGIC C5 PREMIUM following a fasting period of atleast 4 hours. The results of the evaluation were recorded on standardized proforma. Existence of septa-debris, accompanying organ pathology, omental involvement, intestinal wall thickening, peritoneal implants, lymph node, diameter of portal vein, thickening of gall bladder wall, pleural effusion, collateral vascular structure and cavernous transformation were investigated on USG and.

Result of biopsy or surgical intervention were regarded as the gold standard for the pathological diagnosis in all cases. Informed consent was obtained from each patient. Immediately after the ultrasound examination within an average of 14 minutes interval), US guided paracentesis was done under sterile conditions. Blood sample was also drawn immediately after the paracentesis. The ascitic fluid and blood samples were sent to the laboratory to determine ascitic albumin, cell count and differential as well as serum albumin and total protein. A portion of ascitic fluid sample was also sent to the pathology unit for cytology. The serum and ascitic albumin values were used to determine the serumascites albumin gradient (SAAG).

RESULTS

In this study, a total of 50 patients with ascites were included. In the present study, the age of the patients ranged from 05 years to 67 years. The mean age was 48 years. The maximum number of patients 37 (74%) was in the age group of 31-60 years. Out of 50 cases 39 (78%) were having benign ascites and 11 (22%) were having malignant ascites.

Cytological Correlation of Aspirated Ascitic Fluid:

Diagnosis	No. of Cases	Paracentesis		
		Transudative	Exudative	CYT for Malignant Cells
Benign	39	27	12	0
Malignant	11	0	11	11

Imaging findings of all cases were correlated with cytological analysis of ascetic fluid which showed malignant cells in all 11 maligant cases and all of them 11/11(100%)were of exudative nature.

US determined ascites pattern

DISEASE	TRANSDUATE	EXUDATE
BENIGN	26	13
MALIGNANT	0	11

DISCUSSION

Ascites is a common clinical problem. It may the first finding of a systemic disease or can develop due to a disease of abdominal origin. Determination of the ascites etiology is necessary for establishing an appropriate treatment plan. In most cases, investigation of the existence of, and reason for, the ascites starts with physical examination and laboratory tests. Ascites fluid analysis performed following the abdominal paracentesis is an easy and economical method. Clinical diagnosis may be difficult in cases with limited ascites amount.[12] Differentiation between cirrhotic and malignant ascites can be done by history-taking, physical examination, blood and urine tests, abdominal ultrasound, and paracentesis (Risson, 2012). Imaging alone cannot differentiate between the two. However indirect signs can aid in differentiating benign and malignant etiology. Ascites can occur due to various benign and malignant pathologies (Mohammadi *et al*., 2011). In our case series, 50 cases were studied, the age of the patients ranged from 05 years to 67 years. The mean age was 48 years. The maximum number of patients 37 (74%) was in the age group of 31-60 years. Causes were determined to be malignant in 11 cases (22%) and benign in 39 cases (78%). In our series of malignant ascites, Ca ovary, ovarian lymphoma, Ca stomach, ca colon, periampulary carcinoma, disseminated metastases and peritoneal carcinomatosis were causative factors. Most common malignancy was Ca ovary. The causes of benign ascites were pancreatitis, tuberculosis, liver cirrhosis, anaemia,-hypoproteinemia, renal failure, bowel and gall bladder perforation, SABP, extrahepatic portal HTN and CCF. Associated findings found in malignant ascites, were pleural effusion seen in 2/11 (18.2 %), liver metastases in 5/11 (45.4 %), retroperitoneal lymph nodes in 2/11 (18.2 %) and tethered bowel in 5/11 cases (45.4%).

Ultrasound is increasingly used in evaluating ascites. It is an accurate and reliable method of detecting ascites and distribution, guiding paracentesis, and monitoring the effects of therapy. It can distinguish transudative from inflammatory or malignant exudative fluid. USG can differentiate fluid form solid tissue. Differentiation between benign and malignant ascites by ultrasound was considered as difficult or impossible; however certain ultrasonic patterns aid in distinction. Total ascitic fluid protein concentration of 3 g% is used as gold standard which is used in our hospital to differentiate transudative from exudative ascites. According to our study, USG provides a simple, rapid and highly sensitive approach for detection and characteristic of ascites.

CONCLUSION

In conclusion, ultrasound is a reliable, noninvasive and cheaper means of detecting, characterizing and quantifying ascites. It has a significant accuracy in distinguish transudate and exudate ascites and suggesting the underlying cause. It can be a valuable method of investigation of ascites in places where CT and MRI are not available. It is the best complement for laboratory investigation of ascites in suggesting the diagnosis.

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